UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,433	07/26/2006	Anne Boer	TS1407 US	1421

23632 7590 11/02/2009

SHELL OIL COMPANY
P O BOX 2463
HOUSTON, TX 772522463

EXAMINER	
YOUNG, NATASHA E	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
11/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/587,433
Filing Date: July 26, 2006
Appellant(s): BOER ET AL.

Craig M. Lundell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 29, 2009 appealing from the Office action mailed December 24, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on March 24, 2009 has been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,060,127	SAVIN et al	11-1977
3,802,497	KUMMEL et al	04-1974
GB 787,123		12-1957

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 9, 11-13, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) in view of Kummel et al (US 3,802,497).

Regarding claim 1, Savin et al discloses a removable heat transfer module (bundle of tubes) having first and second ends, for use in a reactor for carrying out an exothermic reaction, the heat transfer tubes comprising a heat transfer feed tube (2); a distribution chamber; a plurality of circulation tubes (5); and a collection chamber (8, 9); said heat transfer feed tube (2) having at its first end an inlet (2) for charging the heat transfer module with heat transfer fluid, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet (14) for discharging coolant; wherein the inlet and the outlet are both located towards the same end of the heat transfer module, wherein the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to

a discharge pipe (see column 2, line 56 through column 4, line 26 and figure 1), where it is interpreted that hollow tube (2) is the inlet, heat transfer feed tube, and distribution chamber and where it is disclosed that the heat exchanger is designed to make it possible to remove and replace only that section to which the ruptured tube belongs.

Savin et al does not explicitly disclose coolant module but Savin et al discloses heat-consuming agent that flows through heat transfer tube (5) which are bundled together such that the heat-consuming agent acts as a coolant and the heat transfer tube bundle is a coolant module.

Savin does not disclose the inlet and outlet can be disconnected without the use of a cutting means.

Kummel et al discloses the inlet and outlet can be disconnected without the use of a cutting means (see figure 1; column 6, lines 32-36; and column 8, lines 1-11) by use of flanges.

It would have been obvious to one having ordinary skill in the art at the art at the time the invention was made to modify the teachings of Savin et al with the teachings of Kummel et al such that the inlet and outlet can be disconnected without the use of a cutting means in order to easily the inlet and outlet for cleaning or replacement.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the inlet and outlet be able to be disconnected without the use of a cutting means, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art (see MPEP 2144.04 (V-C)).

Regarding claim 2, Savin et al discloses wherein the second end of the heat transfer feed tube forms the distribution chamber with the circulation tubes connected thereto (see figure 1).

Regarding claim 3, Savin et al discloses wherein the coolant feed tube is located substantially centrally with respect to the circulation tubes (see figure 1).

Regarding claim 4, Savin et al discloses wherein the coolant feed tube protrudes through the collection chamber (see figure 1).

Regarding claim 5, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle comprising between about 20 and about 4,000 circulation tubes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the heat transfer tube bundle comprising between about 20 and about 4,000 circulation tubes, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 6, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle wherein each of the tubes has a length of about 4 to about 40 meters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the length of the tubes are about 4 to about 40 meters,

since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 7, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle wherein the diameter of each circulation tube is from about 1 to about 10 cm.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of each circulation tube is from about 1 to about 10 cm, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 8, Savin et al does not disclose a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section.

It would have been an obvious matter of design choice to have a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section, since applicant has not disclosed that a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a heat transfer module (bundle of tubes) having a square, triangular, rectangular, trapezoidal or hexagonal cross section.

Regarding claim 9, Savin et al discloses a reactor for carrying out an exothermic reaction (see column 2, lines 56-62 and column 3, lines 20-45) which discloses a cylindrical shell (1) where a heating agent is supplied and the heat is transferred to the heat-consuming agent that travels through the heat transfer tubes (5) such that a reaction is taking place within the cylindrical tube (1), said reactor comprising a reactor shell (1); an inlet (12) for introducing reactants into the reactor shell; an outlet (13) for removing products from the reactor shell; and at least one removable heat transfer module having first and second ends, for use in a reactor for carrying out an exothermic reaction, the heat transfer module comprising a heat transfer feed tube; a distribution chamber; a plurality of circulation tubes (5); and a collection chamber (8, 9); said heat transfer feed tube having at its first end an inlet (2) for charging the heat transfer module with heat-consuming agent, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet (14) for discharging heat-consuming agent; wherein the coolant feed tube inlet and the collector chamber outlet are both located towards the same end of the heat transfer module (see column 2, line 56 through column 4, line 26 and figure 1), where it is interpreted that hollow tube (2) is the inlet, heat transfer feed tube, and distribution chamber and where it is disclosed the heat exchanger is designed to make it possible to remove and replace only that section to which the ruptured tube belongs.

Savin et al does not explicitly disclose coolant module but Savin et al discloses heat-consuming agent that flows through heat transfer tube (5) which are bundled together such that the heat-consuming agent acts as a coolant and the heat transfer tube bundle is a coolant module.

Savin et al does disclose the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means.

Kummel et al discloses the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means (see figure 1; column 6, lines 32-36; and column 8, lines 1-11) by use of flanges.

It would have been obvious to one having ordinary skill in the art at the art at the time the invention was made to modify the teachings of Savin et al with the teachings of Kummel et al such that the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means in order to easily the inlet and outlet for cleaning or replacement.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the coolant feed tube inlet and the collection chamber outlet be able to be disconnected without the use of a cutting means, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art (see MPEP 2144.04 (V-C)).

Regarding claim 11, Savin et al discloses a reactor, in which the heat-consuming feed tube (2) protrudes through the collection chamber (8, 9) (see figure 1).

Regarding claim 12, Savin et al discloses a bundle of circulation tubes (see column 3, lines 12-19).

Savin et al does not disclose the heat transfer tube bundle comprising between about 4 and about 100 circulation tubes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the heat transfer tube bundle comprising between about 4 and about 100 circulation tubes, since it has been held the where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

Regarding claim 13, Savin et al discloses a reactor wherein the reactor shell (1) comprises an access for accessing the heat-consuming agent module (see column 4, lines 21-25), which discloses the heat transfer tube bundles may be accessed to remove and replace damaged tube bundles.

Regarding claim 16, Savin et al does not disclose a reactor wherein the outlet comprises a filter.

Filters are known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have reactor with a filter, since it was known in the art that filters are used to purify a fluid (see MPEP 2144.03 (A-E)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a filter at the outlet of the reactor, since it has been held

that rearranging parts of an invention involves only routine skill in the art (see MPEP 2144.04 (VI-C)).

Regarding claim 17, Savin et al and Kummel et al do not disclose a method for carrying out an exothermic reaction comprising the steps of: charging a reactor with reactants; cooling the contents of the reactor and removing products from the reactor, wherein cooling is carried out using at least one cooling module comprising a coolant feed tube; a distribution chamber; a plurality of circulation tubes; and a collection chamber; said coolant feed tube having at its first end an inlet, for charging the cooling module with coolant, and communicating with said distribution chamber at its second end; each of said circulation tubes communicating with the distribution chamber through a first end and communicating with said collection chamber through a second end; the collection chamber having an outlet for discharging coolant; wherein the inlet and the outlet are both located towards the same end of the cooling module, wherein the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe such that they can be disconnected without the use of a cutting means.

However, the prior art references disclose an apparatus capable of carrying out the method such that claim 17 is rejected using the same reasoning used to reject claim 9.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) and Kummel et al (US 3,802,497) as applied to claim 9 above, and further in view of applicant's admitted prior art.

Regarding claim 10, Savin et al does not disclose a reactor wherein the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe.

Applicant admits that the removably connectable means to be used comprises means in the art, see for instance Perry's Chemical Engineers' Handbook, 6th Edition, Chapter 6, 6-41/6-57 and suitable means are flanges, threaded joints (using single or double threaded connection joints), clamp joints, seal ring joints, pressure seal joints, compression fitting joins etc (see page 6, lines 26-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the applicant's admitted prior art such that the inlet is adapted to be removably connectable to a charge pipe and the outlet is adapted to be removably connectable to a discharge pipe for the predictable result of easy removable of parts.

Claims 14-15 and 18are rejected under 35 U.S.C. 103(a) as being unpatentable over Savin et al (US 4,060,127) and Kummel et al (US 3,802,497) as applied to claim 9 and 17 above, and further in view of GB 787,123.

Regarding claim 14, Savin et al does not disclose a reactor further comprising a support for supporting the cooling module.

GB 787,123 discloses a bundle of tubes (27) supported by support member (31) (see page 4, line 103 through page 5, line 26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Savin et al with the teachings of GB 787,123 for the predictable result of extra support.

Regarding claim 15, Savin et al does not disclose a reactor wherein the inlet comprises a sparger.

GB 787,123 discloses a reactor with a sparger (41, 42) (see page 5, lines 61-85).

The combination of the prior art elements of a reactor with a removable cooling module and a sparger would have yielded the predictable result of even distribution of fluid into the reactor.

Regarding claim 18, Savin et al does not disclose a process for the synthesis of hydrocarbons wherein the reactor is charged with syngas.

However, Savin et al discloses an apparatus capable of carrying out the method such that claim 18 is rejected using the same reasoning used to reject claim 15.

(10) Response to Argument

The evidence presented by the appellants was not persuasive to over the rejection.

Regarding claims 1 and 9, appellants argue that the Savin and Kummel references neither, alone or together, disclose or suggest a removable cooling module (see Appeal Brief, page 4).

The examiner disagrees.

The examiner admits that Savin et al does not disclose that the inlet and outlet of the cooling module can be disconnected without the use of a cutting means. However, Savin et al discloses that the heat exchanger is designed to make it possible to remove and replace only that section to which the ruptured tube belongs to facilitate maintenance (see column 4, lines 22-26).

However, the examiner disagrees with the appellants because Kummel et al discloses the coolant feed tube inlet and the collection chamber outlet can be disconnected without the use of a cutting means (see figure 1; column 6, lines 32-36; and column 8, lines 1-11) by use of flanges, which provides for easy cleaning or replacement of the cooling module.

Regarding claim 17, the appellant argues that neither of the references (Savin and Kummel) discloses a method for carrying out an exothermic reaction comprising the steps of charging a reactor with reactant, cooling the contents of the reactor, and removing the products from the reactor, wherein the cooling is carried out using the cooling module as defined in the claim (see Appeal Brief, page 5).

The examiner disagrees.

Savin et al discloses a heating agent (reactant) which is charged into the reactor through pipe (12), cooling the contents of the reactor with the heat-consuming agent that flows inside the tubes (5), and removing the product through pipe (13) from the reactor (see column 3, lines 12-45).

As discussed above the combined teachings of Savin et al and Kummel et al disclose the removable cooling module.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Natasha Young/
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797

Conferees:

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797

/Benjamin L. Utech/
Primary Examiner